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PTO/SB/21 (6-98) (modified)  
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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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#28  
04/28/03  
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## TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

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Application Number	10/047,982
Filing Date	1/14/03
First Named Inventor	Steve Teig
Group Art Unit	<none yet>
Examiner Name	<none yet>
Attorney Docket Number	SPLX.P0053

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### Enclosures (Check all that apply)

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### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Or Individual name	Mani Adeli, Reg. No. 39,585 of Stattler Johansen & Adeli LLP
Signature	
Date	April 23, 2003

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Dated: April 23, 2003

Respectfully submitted,

By: \_\_\_\_\_

Mani Adeli  
Registration No. 39,585

Stattler, Johansen & Adeli LLP  
P.O. Box 51860  
Palo Alto, CA 94303-0728

Phone No. (650) 752-0990 x102  
Fax No. (650) 752-0995



PATENT  
Docket No. SPLX.P0053

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Mark Adeli

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Steve Teig

Serial No.: 10/047,982

Filing Date: 1/14/02

For: METHOD AND APPARATUS FOR  
PROBABILISTIC ROUTING

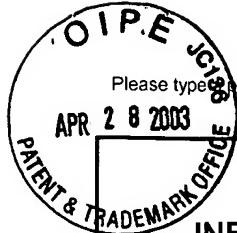
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STATEMENT UNDER 37 C.F.R. § 1.97**

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Washington, D.C. 20231

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO-1449. Copies of the documents are also submitted herewith. The Examiner is requested to make these documents of record. Applicants would appreciate the Examiner initialing and returning the Form PTO-1449, indicating that the information has been considered and made of record herein.



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Substitute for form 1449A/PTO				Application Number	10/047,982
				Filing Date	1/14/02
				First Named Inventor	Steve Teig
				Group Art Unit	
				Examiner Name	
Sheet	1	of	1	Attorney Docket Number	SPLX.P0053

U.S. PATENT DOCUMENTS					
Examiner* Initials	Cite No. <sup>1</sup>	U.S. Patent Document Number	Kind Code <sup>2</sup> (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY
	1.	2001/ 0003843	A1	Scepanovic et al.	06-14-01
	2.	4,615,011		Linsker	09-30-86
	3.	4,673,966		Shimoyama	06-16-87
	4.	4,782,193		Linsker	11-01-88
	5.	4,855,929		Nakajima	08-08-89
	6.	5,097,422		Corbin II et al.	03-17-92
	7.	5,251,147		Finnerty	10-05-93
	8.	5,281,151		Arima et al.	01-25-94
	9.	5,360,948		Thornberg	11-01-94
	10.	5,375,069		Satoh et al.	12-20-94
	11.	5,532,934		Rostoker	07-02-96
	12.	5,578,840		Scepanovic	11-26-96
	13.	5,633,479		Hirano	05-27-97
	14.	5,634,093		Ashida et al.	05-27-97
	15.	5,636,125		Rostoker et al.	06-03-97
	16.	5,650,653		Rostoker et al.	07-22-97
	17.	5,657,242		Sekiyama et al.	08-12-97
	18.	5,723,908		Fuchida et al.	03-03-98
	19.	5,742,086		Rostoker et al.	04-21-98
	20.	5,757,656		Hershberger et al.	05-26-98
	21.	5,777,360		Rostoker et al.	07-07-98
	22.	5,811,863		Rostoker et al.	09-22-98
	23.	5,822,214		Rostoker et al.	10-13-98
	24.	5,859,449		Kobayashi et al.	01-12-99
	25.	5,898,597		Scepanovic et al.	04-27-99

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				First Named Inventor	Steve Teig
				Group Art Unit	
				Examiner Name	
Sheet	2	of	2	Attorney Docket Number	SPLX.P0053

U.S. PATENT DOCUMENTS					
26.	5,914,887		Scepanovic et al.	06-22-99	
27.	5,973,376		Rostoker et al.	10-26-99	
28.	6,035,108		Kikuchi	03-07-00	
29.	6,058,254		Scepanovic et al.	05-02-00	
30.	6,067,409		Scepanovic et al.	05-23-00	
31.	6,068,662		Scepanovic et al.	05-30-00	
32.	6,123,736		Pavsic et al.	09-26-00	
33.	6,134,702		Scepanovic et al.	10-17-00	
34.	6,155,725		Scepanovic et al.	12-05-00	
35.	6,175,950	B1	Scepanovic	01-16-01	
36.	6,216,252	B1	Dangelo et al.	04-10-01	
37.	6,230,306	B1	Raspopovic et al.	05-08-01	
38.	6,247,167	B1	Raspopovic et al.	06-12-01	
39.	6,260,179	B1	Ohsawa et al.	07-10-01	
40.	6,262,487	B1	Igarashi et al.	07-17-01	
41.	6,289,495	B1	Raspopovic	09-11-01	
42.	6,301,686	B1	Kikuchi et al.	10-09-01	
43.	6,327,694	B1	Kanazawa	12-04-01	
44.	6,378,121	B2	Hiraga	04-23-02	
45.	6,385,758	B1	Kikuchi et al.	05-07-02	
46.	6,401,234	B1	Alpert et al.	06-04-02	
47.	6,405,358	B1	Nuber	06-11-02	
48.	6,412,097	B1	Kikuchi et al.	06-25-02	
49.	6,412,102	B1	Andreev et al.	06-25-02	
50.	6,436,804	B2	Igarashi et al.	08-20-02	
51.	6,446,245	B1	Xing et al.	09-03-02	
52.	6,516,455	B1	Teig et al.	02-04-03	

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				First Named Inventor	Steve Teig
				Group Art Unit	
				Examiner Name	
Sheet	3	of	3	Attorney Docket Number	SPLX.P0053

U.S. PATENT DOCUMENTS						
	53.	6,516,455	B1	Teig et al.	02-04-03	
	54.	2003/0025 205	A1	Shively	02-06-03	

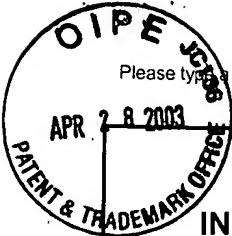
FOREIGN PATENT DOCUMENTS							
Examiner* Initials	Cite No. <sup>1</sup>	Foreign Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code (if known) <sup>5</sup>			
	55.	JP	64-15947	Ouchi	01-19-89		
	56.	JP	04000677	Fujiwara et al.	01-1992		

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				Group Art Unit	
				Examiner Name	
Sheet	4	of	4	Attorney Docket Number	SPLX.P0053

### OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

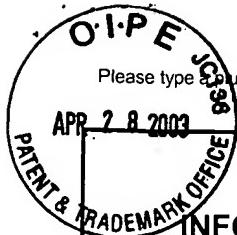
Examiner* Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>
	57.	A.H. Farrahi, et al., Quality of EDA CAD Tools: Definitions, Metrics and Directions, Quality Electronic Design, 2000, Proceedings of the first International Symposium on March 2000, pp 395-405.	
	58.	A. Vannelli, et al., An adaptation of the interior point method for solving the global routing problem, 2/1991, IEEE pp 193-203.	
	59.	B. Berger, et al., Nearly Optimal Algorithms and Bounds for Multilayer Channel Routing, Journal of the Association for Computing Machinery, pp. 500-542, March 1995.	
	60.	C. Chiang, et al., Wirability of Knock-Knee Layouts with 45° Wires, IEEE Transactions on Circuits and Systems, Vol. 38, Issue 6, pp 613-624, June 1991.	
	61.	G. Overtone, EDA Underwriter 2 Finding Space in a Multi Layer Board, Electronic Engineering, Morgan-Grampian LTD, vol. 67, No. 819, pp 29-30.	
	62.	G.D. Hachtel et al., Linear Complexity Algorithms for Hierarchical Routing, 1/89, IEEE pp 64-80.	
	63.	J.D. Cho, et al., Four-Bend Top Down Global Routing, IEEE, pp 793-802, 1998.	
	64.	J. Su et al., Post Route Optimization for Improved Yield Using Rubber-Band Wiring Model, 1997 International Conference on Computer-Aided Design, pp 700-706, November 1997.	
	65.	J. Vicente, RSR: A New Rectilinear Steiner Minimum Tree Approximation for FPGA Placement and Global Routing, Proceedings of the 24 <sup>th</sup> Euro Micro Conference, pp 192-195, August 1998.	
	66.	K. Powers et al., The 60° Grid: Routing Channels in Width d/square root 3, VLSI, 1991, Proceedings., First Great Lakes Symposium on Kalamazoo, MI, USA, pp 214-291, March 1991.	
	67.	M. Alexander et al., Performance-Oriented Placement and Routing for field-programmable gate arrays, Proceedings of the European Design Automation Conference, pp 80-85, 1995.	
	68.	M. Alexander et al., Placement and Routing for Performance-Oriented FPGA Layout, VLSI Design, Vol. 7, No. 1, 1998.	
	69.	M. Igarashi et al., A Diagonal-Interconnect Architecture and Its Application to RISC Core Design, 2002 IEEE Solid-State Circuits Conference, pp 210-460, February 2002.	
	70.	P. Dood, et al., A Two-Dimensional Topological Compactor with Octagonal Geometry, 28 <sup>th</sup> ACM/IEEE Design Automation Conference, pp 727-731, July 1991	
	71.	P. Parakh, et al., Congestion Driven Quadratic Placement, Proceedings of Design Automation Conference, 1998, pp 275-278.	
	72.	R. Putatunda et al., VITAL: Fully Automatic Placement Strategies for Very Large Semicustom Designs, Proceedings of the International Conference on Computer Design: VLSI in Computers and Processors, pp 434-439 October 1988.	

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				First Named Inventor	Steve Teig
				Group Art Unit	
				Examiner Name	
Sheet	5	of	5	Attorney Docket Number	SPLX.P0053

#### OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

73.	S. Dutt, et al., Probability-Based Approaches to VLSI Circuit Partitioning, IEEE Trans. On Computer Aided Design of IC's and Systems, Vol. 19, No. 5, May 2000, pp 534-549.
74.	Y. Sekiyama et al., Timing-Oriented Routers for PCB Layout Design of High-Performance Computers, International Conference on Computer Aided Design, pp 332-335, November 1991.
75.	C. Leiserson et al., Algorithm for Routing and Testing Routability of Planar VLSI Layouts, pp 69-78, May 1985.
76.	S. Das et al., Channel Routing in Manhattan-Diagonal Model, 9 <sup>th</sup> International Conference on VLSI Design, January 1996. pp 43-48.
77.	W. Wei-Ming Dai et al., Routability of a Rubber-Band Sketch. 28 <sup>th</sup> ACM/IEEE Design Automation Conference, 1991. pp 45-65.
78.	H. Chen, Routing L-Shaped Channels in Nonslicing-Structure Placement. 24 <sup>th</sup> ACM/IEEE Design Automation Conference, 1987. pp 152-165, 1987.
79.	I. Tollis, Techniques for Wiring in Non-Square Grids, pp 66-69. May 1989.
80.	E. Lodi et al., A 2d Channel Router for the Diagonal Model, pp 111-125, April 1991.
81.	E. Lodi et al., Routing in Times Square Mode, pp 41-48, June 1990.
82.	K. Cheng-Kok et al., Manhattan or Non Manhattan? A Study of Alternative VLSI Routing Architectures. pp 47-52, 2000
83.	E. Lodi et al., Routing Multiterminal Nets in a Diagonal Model, pp 899-902, 1988.
84.	D. Staepelaere et al., Surf: A Rubber-Band Routing System for Multichip Modules. pp 18-26, 1993.
85.	S. Das et al., Routing of L-Shaped Channels, Switch boxes and Staircases in Manhattan-Diagonal Model, pp 65-70m January 1998.
86.	W. Schiele et al., A Gridless Router for Industrial Design Rule, 27 <sup>th</sup> ACM/IEEE Design Automation Conference, pp 626-631, 1990.
87.	J. Nester, A New Look at Hardware Maze Routing, Proceedings of the 12 <sup>th</sup> ACM Symposium on Great Lakes Symposium on VLSI, pp 142-147, April 2002.

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